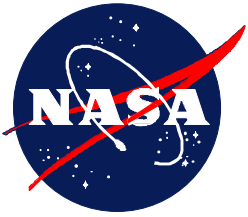


Mission Assurance Guidelines for the University Earth System Science Project

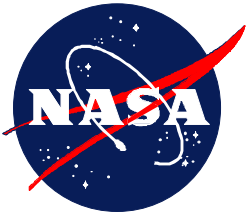
April 27, 2000



Agenda

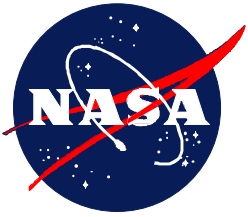


- ☐ Introduction
- ☐ Design/Quality Assurance
- ☐ Systems Review
- ☐ Risk Mitigation and Mission Readiness
- ☐ Requirements Verification
- ☐ Flight and Ground Safety
- ☐ References



Introduction

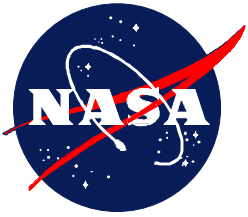
- ❑ Each Earth Explorers project/mission must plan and implement a comprehensive Mission Assurance program.
 - It must apply to all flight hardware, software, ground support equipment and mission operations.
 - It must include the following systems/processes:
 - design assurance
 - quality assurance
 - systems review
 - requirements verification
 - risk mitigation
 - mission readiness



Design Assurance



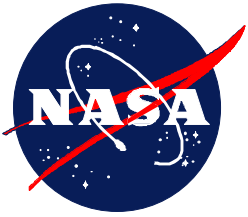
- ❑ The project/mission team must plan and implement:
 - A parts program that assures mission reliability and performance requirements are met.
 - A materials and processes program that addresses materials and fastener selection.
 - A reliability program which interacts with all mission disciplines such that design, manufacture and test activities are executed to assure mission success.
 - A structured program for software development.



Quality Assurance



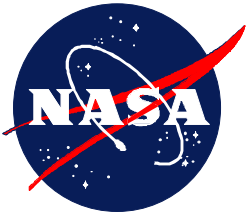
- ❑ The project/mission team must:
 - Define and implement a quality system based on ANSI/ASQC Q9001-1994 that meets the intent of ISO 9001.
 - Impose workmanship standards which assure mission lifetime and performance requirements are met.
 - Define and implement a failure reporting system.



System Reviews



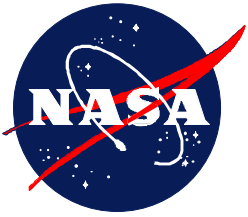
- ❑ Required reviews for Earth Explorer projects/missions:
 - Preliminary Design Review (PDR)
 - Mission Design Review (MDR)
 - Confirmation Readiness Review (CRR)
 - Critical Design Review (CDR)
 - Pre-Environmental Review (PER)
 - Pre-Ship/Operational Readiness Review (PSR/ORR)
 - Mission Readiness Review (MRR)
 - Flight Readiness Review (FRR)



Additional Mission Reviews



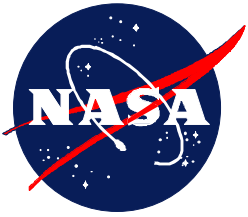
- ☐ Additional Mission Reviews supplement the required reviews and shall be conducted by independent consultants, peers or project/mission team personnel.
- ☐ Systems Requirements Review - Recommended
 - Peer Reviews - Recommended
 - Risk Mitigation Reviews - Required



Risk Mitigation/Mission Readiness



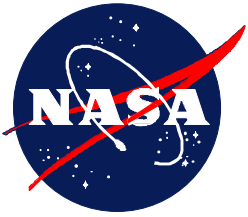
- ❑ Risk Mitigation and Mission Readiness will be evaluated by GSFC and KSC through reviews.
 - Risk mitigation reviews will be implemented as part of the review process beginning at CDR.
 - The reviews will enhance the probability of mission success and will cover the following mission elements:
 - Spacecraft and instrument(s)
 - Mission operations
 - Launch vehicle integration
 - Mission-unique items for launch vehicle and mission operations



Requirements Verification



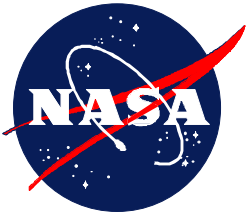
- ❑ Each project/mission team must conduct a verification program to ensure all flight hardware meets the specified mission requirements.
- ❑ Survival of all expected environments must be simulated by functional demonstration, analysis, physical measurement or test.
 - Adequate documentation must be provided, including a verification plan, matrix and procedures.
 - Guidelines are contained in the GSFC General Environmental Verification Specification for STS and ELV Payloads, Subsystems and Components (GEVS).



Flight and Ground Safety



- ❑ Each project/mission team will establish, implement and maintain a system safety program which:
 - Identifies and control hazards for personnel, hardware, facilities and equipment.
 - Meets safety requirements for the appropriate launch site.
 - Meets industrial safety requirements for each team member's institution.



References



- ☐ Earth Explorers Program Mission Assurance Guidelines & Requirements
- ☐ Earth Explorers Program Project/Mission Confirmation Plan
- ☐ Earth Explorers Program Flight & Ground Safety Requirements
- ☐ All references are available on the Earth Explorers Program library web site:

<http://earthexplorers.gsfc.nasa.gov/library.html>